Transport Canada Transports Canada

TP 1624

Marine Casualty Investigations

Enquêtes sur les accidents maritimes

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE GROUNDING OF THE "J.C. PHILLIPS" IN THE MIRAMICHI RIVER, APRIL 11, 1986.

REPORT No. 437

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE GROUNDING OF THE "J.C. PHILLIPS" IN THE MIRAMICHI RIVER, APRIL 11, 1986.

Particulars of Vessel

Name	"J.C. PHILLIPS" ex "GULF GATINEAU" (1985)
Official Number	370929
Port of Registry	Toronto
Call Sign	VOPL
Gross Tonnage	5,924
Net Tonnage	4,176
Length	126.19 m
Breadth	18.32 m
Depth	8.69 m
Draught (at time of incident)	F: 6.81 m A: 6.90 m
Type	Tanker
Built	1976 Sorel, Quebec
Propulsion	One, 8 cylinder, turbo charged, diesel engine, developing 5,000 b.h.p. and driving a single controllable-pitch propeller with Kamewa bridge control, 13.5 knots.
Lloyds Classification	+100A1, +LMC, Ice Class I (equivalent to CCGSS Type B)
Owner	Société Sofati/Soconav Ltée Montreal, Quebec
Charterer	Ultramar Canada Don Mills, Ontario

Navigating Equipment

Radar (1)	10 cm Anritsu AR 0.25-96 nm
Radar (2)	5 cm Decca AC1226 0.25-48 nm
Direction Finder	Marconi Marine Lodestar III
Echo Sounder (1)	Elac 0-320 fm
Echo Sounder (2)	Elac 0-320 fm
Loran 'C' (1)	Sitex Koden 192
Loran 'C' (2)	Sitex Koden 707
Sat-Nav	Racal-Decca DS5
VHF (1)	SRA ME60
VHF R/T (2)	SRA ME61
MF R/T	Sailor T124

Vessel Description

This is an oil product tanker with five cargo tanks subdivided longitudinally into 15 compartments extending from the deck to the bottom shell plating. There are double bottom tanks beneath the engine-room which are used for the carriage of propulsion fuel oil. The hull is ice strengthened and the bow plates have a thickness of 22 mm.

The vessel is classed with Lloyds and all her certificates are valid.

NOTE: 1. All times expressed in this report are Eastern Standard Time (UTC minus 5 hours)

2. A glossary of terms and abbreviations may be found following the Findings in this report.

Background

The "J.C. PHILLIPS" departed from St. Romuald, Quebec, April 8, 1986, on a voyage to Chatham, New Brunswick.

Whilst upbound in the Miramichi River, she became beset in heavy ice and, with the strong influence of a flood tide, was set to the south-west from the navigable channel,

grounding in mud in position 47°07.1'N, 65°10.0'W. There were neither injuries nor pollution as a result of this incident. The vessel later refloated herself and steamed clear of the Miramichi.

Since 1975, this is the fifth reported casualty in the Miramichi River attributable to the movement of ice in that locality during the winter season. The "J.C. PHILLIPS" (then "Gulf Gatineau") grounded exactly one year previously, on April 11, 1985, near buoys 54M and 55M, under similar circumstances. Fortunately, all except one of the incidents resulted in no apparent damage due to the nature of the bottom in the area.

Narrative

The "J.C. PHILLIPS" departed from St. Romuald, Quebec, at 0045, April 8, 1986, with a crew of 24. She was bound for Chatham, New Brunswick, with a cargo of 7,018 tonnes of diesel oil and 1,479 tonnes of unleaded gasoline. She also carried 195 tonnes of fuel oil and the departure draught was 6.93 m forward and 7.08 m aft.

The vessel made an uneventful passage to the mouth of the Miramichi River, arriving there and coming to anchor at 2050, April 9. She remained at anchor throughout the next 36 hours due to restricted visibility and heavy swell conditions at the outer bar.

At 0755, April 11, a pilot boarded the vessel and at 0810, she proceeded upriver against an ebb tide. At 0900, light broken ice was encountered and at 0941, in a position approximately 5 cables west of buoy M34, the vessel entered a large floe of grey-white ice and white ice. Forward progress was slow as the vessel attempted to proceed through the ice which had an estimated thickness of 50-60 cm.

A steady NE'ly wind of 10 knots had been constant throughout the morning and which, in fact, persisted during the ensuing hours. Visibility had varied from 2 cables to 3 miles during periods of fog, rain and light rain.

Initial reports indicated that the ice was shore-fast but, by 1400, it became apparent that the ice had broken free from the shore and was drifting with the now flood tide. By 1430, the vessel was totally beset in the ice-floe and despite efforts to maintain a position within the navigable channel, she was being forced to the south-west by the flood tide. This situation was reported to Ice Operations, Halifax by the master at 1434. At 1455, the "J.C. PHILLIPS",

aground, ceased further movement in a position 7.5 cables south of the Grand Dune range dredged channel.

Soundings were taken of all tanks and compartments and these indicated that all were intact. Depth soundings taken around the vessel at 1530 indicated a minimum depth of 4.57 m on the port side, 5.48 m at the bow and 6.40 m at the stern.

At 1634, a sitrep was broadcast to Ecareg via CGRS Charlottetown and an ice-breaker was requested. At 1749 CGS "TUPPER" was dispatched to the area by Ice Operations, Halifax.

High water was at 1740, at which time efforts were made to refloat the vessel but she remained aground. Efforts continued until 1825 when the master decided to wait until high water the following morning before a further attempt at refloating would be made.

A continuous watch was maintained for any sign of pollution. During the night, 60 tonnes of fresh water was pumped out from the afterpeak tank and this reduced the after draught by 10 cm.

At 0310, April 12, the engines were put to full astern and, at 0435, the vessel gained sternway. The dredged channel was reached at 0600 at which time the master decided to return to the safety of open water. At 1007, the vessel came to anchor off Escuminac Pilot Station, to await orders from the owner. Further tank soundings and cargo ullages revealed that there was no apparent hull penetration.

At 0925, April 13, CG Helicopter #74 CGCHB, based on CGS "TUPPER", surveyed the area and reported that ice battures of up to 4 square miles were drifting in Miramichi Bay and recommended that no vessels enter the area.

At 1030, the "J.C. PHILLIPS" was advised by her owner to proceed to Gaspé for cargo discharge, at which port she arrived at 1002, April 14, 1986.

Analysis

1. Ice and Weather Conditions

The "J.C. PHILLIPS" was at anchor at the mouth of the Miramichi River from 2050, April 9, until 0810, April 11.

Prior to anchoring, the wind conditions were predominantly easterly gales 25 to 40 knots decreasing to 10 knots on April 10. These conditions evidently had built up a considerable swell on the outer bar. Because of this and poor visibility due to precipitation and fog, the master elected to wait for improved conditions before attempting the river transit.

Ice Central, Ottawa transmits three ice analysis charts at 2200, 0014 and 1300 UTC daily. These charts were received aboard the "J.C. PHILLIPS" through a facsimile printout machine.

Due to the comparative remoteness of the Miramichi River area, the ice charts do not give a detailed description of ice presence in that area. However, ice information is transmitted to vessels from Ice Halifax via Ecareg, together with conditions expected enroute and the recommended track to the Miramichi. This information was received on board the "J.C. PHILLIPS" on April 9, 1986. No local information was available at that time because there was no Coast Guard vessel in the area of the Miramichi.

Prior to boarding the vessel, the pilot had ascertained, within the limitations afforded the area, the ice conditions in the middle and upper reaches of the Miramichi River. This was accomplished by contacting other pilots, who are domiciled on the northern and southern shores of the river, through 'Chatham Pilot' dispatch.

At the time of receiving the information, ice was shore-fast on the northern banks.

As the vessel proceeded up the Miramichi River, shore-fast ice could be seen across the Grand Dune Channel extending for a distance of about 2 miles. As the vessel was slowly manoeuvring through this floe, it evidently broke free from the north shore and, with only some 150 m to go to clear water, the vessel was beset.

The high/low air temperatures recorded at the Chatham recording station for April 9, 10 and 11, were +0.8/ -0.3, +3.0/-0.6 and +3.2/-0.5 degrees Celsius respectively.

It is conceivable that the shore-fast ice broke free due to a combination of:

(a) shift of wind (to the north-east);
(b) change of tide;
(c) increasing temperature, and
(d) projected vibration from the propulsion of the vessel.

Following this incident, an aerial survey was conducted by a Coast Guard helicopter and, subsequent to that, CGS "TUPPER" arrived in the area. From this vessel, frequent detailed reports were sent to Ice Operations, Halifax until April 20 at which time, the river was virtually ice free. These reports reflected how the ice conditions can and did change dramatically over a 24-hour period.

2. **Chart of the area**

The chart in use aboard the vessel, CHS chart No. 4910, was corrected and up to date. This chart has a scale of 1:50,000 and is the largest scale chart available for the area. It is planned, however, that two charts of a larger scale will replace chart 4910 in the future. The scale of the chart did not contribute to the grounding in this incident.

3. **The Miramichi**

The Grand Dune Channel, approximately 4.3 miles long and 60 m wide, lies WNW/ESE between buoy M31 and M41 and has a least depth of 7.5 m (1984). The sea-bed in the area is predominately mud and sand. Consequently, the "J.C. PHILLIPS" sustained no apparent damage when she grounded.

Due to the narrow navigable channel, ebb tide and the presence of a heavy ice-floe, it was impossible for the vessel to turn about and head back to sea.

Tides in the area, based on high and low water at Escuminac, vary in flood duration depending on the range but have a fairly constant ebb duration.

During the 48-hour period of April 10-12, 1986, the flood duration varied from 4 hours 50 minutes with a tidal rise of +0.27 m to 7 hours 40 minutes with a tidal rise of +1.06 m. During the same period, the ebb duration varied from 5 hours 45 minutes with a tidal fall of 0.54 m to 6 hours 10 minutes with a tidal fall of 0.73 m.

The rate of the tidal stream varies considerably from

normal unaffected conditions of approximately 1-2 knots to conditions of run-off and wind effect where rates in excess of 5 knots have been experienced.

On the day of the incident, low water in the Grand Dune Channel was at approximately 1158 with a height of 0.18 m above chart datum and high water at approximately 1757 with a height of 0.82 m above chart datum. At the time of the incident, the tide was approximately at half flood with a height of 0.50 m above chart datum and an estimated rate of approximately one knot. With a charted depth of 4.7 m at the position where the vessel came to rest, the depth of water at the time, with the tidal increase, would have been approximately 5.2 m as opposed to the maximum draught of the vessel of 6.9 m.

4. Navigation

A standard three watch system is maintained on the "J.C. PHILLIPS" with the deck cadet supplementing the 0800-1200 and 1600-2000 watches. At 0755, April 11, 1986, a pilot and a trainee pilot boarded the vessel so that, thereafter, the bridge was manned by the two pilots, the master, the OOW, a QM and, until 1200, a deck cadet. The master had the conduct of the vessel acting on the pilot's advice; the OOW was manning the engine controls and one radar; the vessel was in the manual steering mode with a QM at the wheel and the cadet was monitoring the echo sounding machine. Courses were various throughout the upriver transit as were the engine movements to enable the vessel to clear a passage through the ice. Once the vessel was in the heavy ice, the engine controls were alternated between full ahead/full astern pitch in efforts to break through.

At noon, the vessel was reportedly a little to the north of the charted track and just west of buoy M36. At that time, she was surrounded by heavy ice and was being swept in a SW'ly direction. Despite efforts to counter the ice and tidal effects, the vessel was eventually forced on to the Grand Dune flat.

The buoys left in for the winter were winter spar buoys and reportedly were all in position at the time of the casualty.

5. Other Reported Casualties

According to Transport Canada's records since 1975, the following previous groundings have occurred in the

Miramichi River due to vessels being forced aground by ice or due to channel buoys having been shifted by ice:

Date	V/l name	Type	Gross tons	Damage
18.12.76	FALKNES	General Cargo	4,908	Considerable
18.4.82	BETELGUESE	General Cargo	6,068	None apparent
27.4.84	FARNES	Bulk Carrier	8,115	None apparent
11.4.85	GULF GATINEAU*	Product Tanker	5,924	None

The incidents involving the "FALKNES" and the "FARNES" were reported to have resulted because buoys had been moved out of position by ice. The other two casualties and the subject incident were caused by the vessel being forced aground by shifting ice.

6. **Experience and Qualifications**

The pilot was issued a license by the Atlantic Pilotage Authority in 1956 and has piloted in the Miramichi since that time.

The master holds a Canadian Home Trade Master's Certificate issued in 1976. He has been at sea for 19 years including 5 years in command and on this vessel. He has many years of experience navigating in ice and has transited the Miramichi on several previous occasions.

Findings

The "J.C. PHILLIPS" grounded in the Miramichi River as a result of the effects of heavy ice and tidal influence. There was no apparent damage to the vessel.

It would appear that:

- the ice was initially shore-fast but broke free during the vessel's transit of the Grand Dune channel;

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* re-named "J.C. PHILLIPS"

- the ice was set to the southward by the flood tide carrying the beset vessel with it, and
- no detailed ice conditions for the area were available.

Other Findings

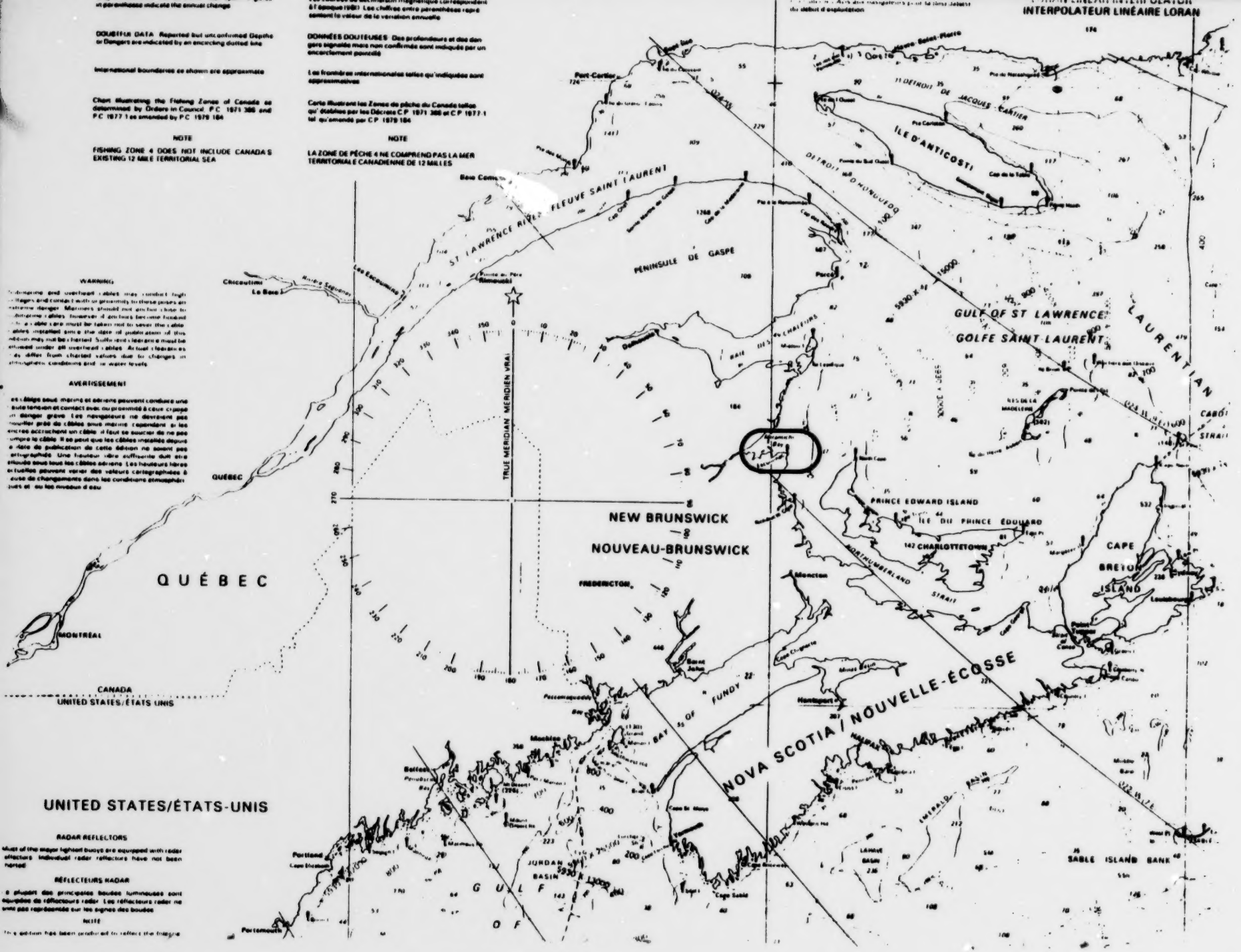
- Subsequent to the incident, a constant ice patrol of the area was maintained and frequent reports dispatched to Ice Operations, Halifax, until the area was ice free.

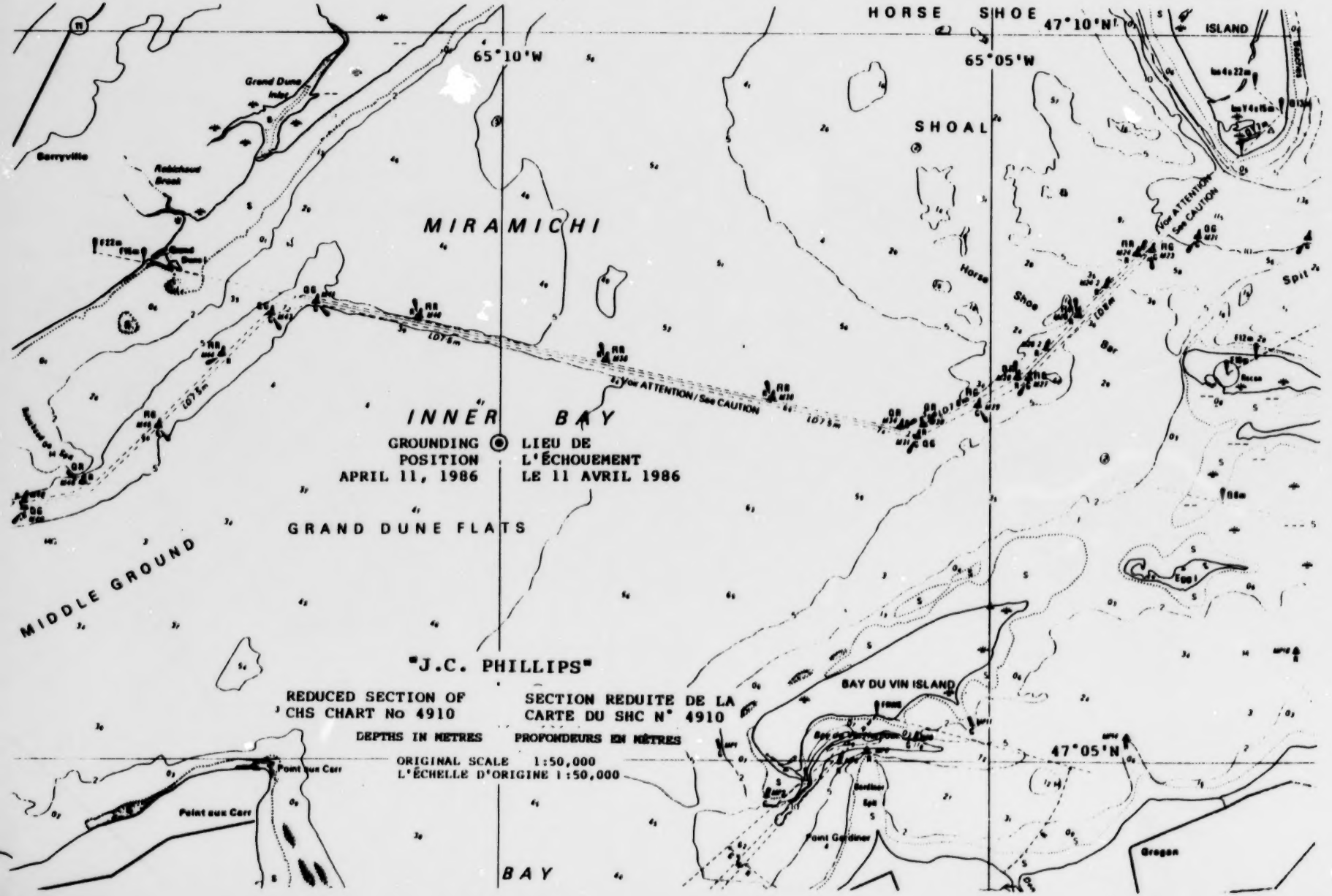
OTTAWA, ONTARIO
OCTOBER, 1986.

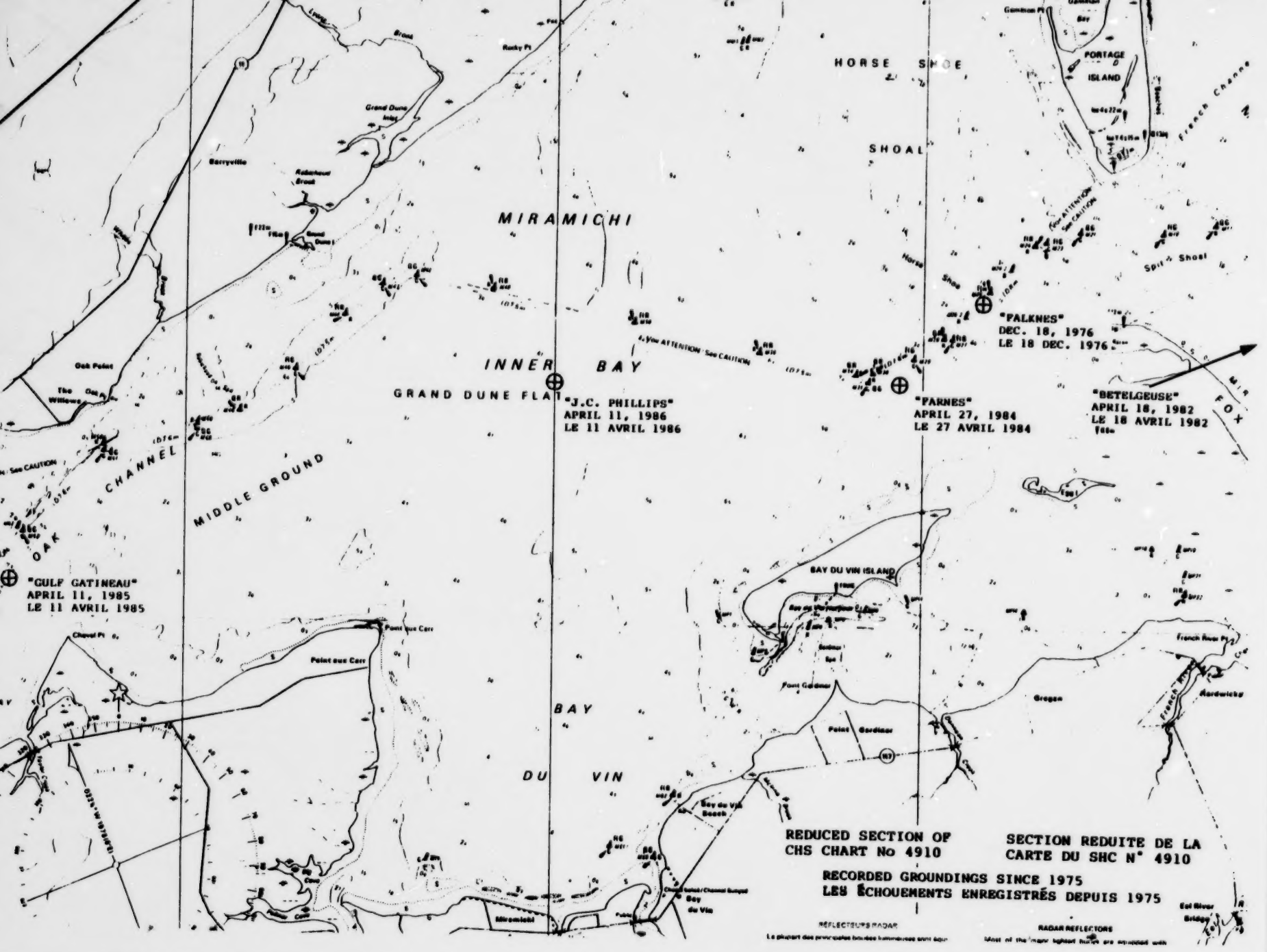
Glossary

Bar	A bank or shoal usually at the mouth of a river obstructing the entrance or making it difficult for transit.
Batture	A large, thick, uneven and discoloured floe often up to 5 miles or more across, identified by the presence of mud on the underside or in the adjacent water.
Beset	A situation where a vessel is surrounded by ice and unable to move.
CCGSS	Canadian Coast Guard Ship Safety.
CGRS	Coast Guard Radio Station
CGS	Coast Guard ship
Chart Datum	The plane of reference to which all data as to depths on charts are referred.
CHS	Canadian Hydrographic Service
Ecareg	Eastern Canada Traffic System
Floe	Any relatively flat piece of sea ice 20 m or more across.
Grey-white ice	Young ice up to 30 cm thick.
MF R/T	Medium frequency radio telephone
OOW	Officer of the Watch
QM	Quartermaster
Shore-fast ice	Sea ice which forms and remains fast along the coast where it is attached to the shore
Sit-rep	Situation report
Tidal fall	Difference in height of high and low water

Tidal rise	Difference in height of low and high water
Ullage	The amount that a partially filled tank lacks being full. Usually the distance between the surface of the liquid and the tank top.
UTC	Coordinated Universal Time
VHF R/T	Very high frequency radio telephone


DOUBTFUL DATA Reported but unconfirmed Depths or Dangers are indicated by an encircling dotted line
International boundaries as shown are approximate
Chart illustrating the Fishing Zones of Canada as determined by Orders in Council P.C. 1971-388 and P.C. 1977-1 as amended by P.C. 1979-184
NOTE
FISHING ZONE 4 DOES NOT INCLUDE CANADA'S EXISTING 12 MILE TERRITORIAL SEA
DONNÉES DOUTEUSES Des profondeurs et des dangers signalés mais non confirmés sont indiqués par un encerclement pointillé
Les frontières internationales telles qu'indiquées sont approximatives
Carte illustrant les Zones de pêche du Canada telles qu'établies par les Décrets C.P. 1971-388 et C.P. 1977-1 tel qu'amendé par C.P. 1979-184
NOTE
LA ZONE DE PÊCHE 4 NE COMPREND PAS LA MER TERRITORIALE CANADIENNE DE 12 MILLES
WARNING
AVERTISSEMENT
QUÉBEC
NEW BRUNSWICK
NOUVEAU-BRUNSWICK
PRINCE EDWARD ISLAND
ÎLE DU PRINCE ÉDOUARD
NOVA SCOTIA / NOUVELLE-ÉCOSSE
GULF OF ST LAWRENCE
GOLFE SAINT-LAURENT
ÎLE D'ANTICOSTI
PENINSULE DE GASPE
ST LAWRENCE RIVER / FLEUVE SAINT-LAURENT
TRUE MERIDIAN / MERIDIEN VRAI
CANADA
UNITED STATES/ÉTATS UNIS
UNITED STATES/ÉTATS-UNIS
RADAR REFLECTORS
RÉFLECTEURS RADAR
NOTE
INTERPOLATEUR LINÉAIRE LORAN
QUEBEC
MONTREAL
FREDERICTON
Moncton
Saint John
Halifax
Portland
Portsmouth
Sydney
Port-Cartier
Baie Comeau
Chicoutimi
La Baie
Les Escoumins
Rivière-du-Loup
Rimouski
Percé
Cap-aux-Meules
Charlottetown
Pictou
Louisbourg
Yarmouth
Lunenburg
Liverpool
Shelburne
Barrington
Cape Sable
Canso
Mulgrave
Port-aux-Basques
Argentia
Placentia
Harbour Grace
St. John's
Cape Race
Cape Spear
Cape Breton Island
Northumberland Strait
Bay of Fundy
Jordan Basin
Sable Island Bank
Laurentian Channel
Detroit de Jacques Cartier
Detroit de Honguedo
Baie des Chaleurs
Baie des Ha! Ha!
Cabot Strait
Strait of Canso
Strait of Belle Isle


HORSE SHOE
47°10'N
65°10'W
65°05'W
ISLAND
SHOAL
MIRAMICHI
Grand Dune Index
Barryville
Redshead Point
Horse Shoe Bar
Spit
Your ATTENTION / See CAUTION
INNER BAY
GROUNDING POSITION APRIL 11, 1986
LIEU DE L'ÉCHOUEMENT LE 11 AVRIL 1986
GRAND DUNE FLATS
MIDDLE GROUND
"J.C. PHILLIPS"
REDUCED SECTION OF CHS CHART No 4910
SECTION REDUITE DE LA CARTE DU SHC N° 4910
DEPTHS IN METRES
PROFONDEURS EN MÈTRES
ORIGINAL SCALE 1:50,000
L'ÉCHELLE D'ORIGINE 1:50,000
BAY DU VIN ISLAND
47°05'N
Point aux Carr
Point Gardiner
Gregson
BAY


HORSE SHOE
SHOAL
PORTAGE ISLAND
MIRAMICHI
INNER BAY
GRAND DUNE FLAT
"J.C. PHILLIPS"
APRIL 11, 1986
LE 11 AVRIL 1986
"FALKNES"
DEC. 18, 1976
LE 18 DEC. 1976
"FARNES"
APRIL 27, 1984
LE 27 AVRIL 1984
"BETELGEUSE"
APRIL 18, 1982
LE 18 AVRIL 1982
"GULF GATINEAU"
APRIL 11, 1985
LE 11 AVRIL 1985
OAK CHANNEL
MIDDLE GROUND
BAY DU VIN
BAY DU VIN ISLAND
Point aux Carr
Point Gardiner
Oak Point
The Willows
Barryville
Grand Dune Inlet
Rocky Pt
Spit
Shoal
French Channel
Gregson
Nordwicks
Bay du Vin Beach
Channel Buoyed
Miramichi
REDUCED SECTION OF CHS CHART No 4910
SECTION REDUITE DE LA CARTE DU SHC N° 4910
RECORDED GROUNDINGS SINCE 1975
LES ÉCHOUEMENTS ENREGISTRÉS DEPUIS 1975
RÉFLECTEURS RADAR
RADAR REFLECTORS